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F. 3476.  
October, 1924.

# **G.E.C.**

## **"WEMBLEY" LANTERN**

For Street Lighting.

(Patent No. 217029.)



Cat. No. FC. 6046/7. "WEMBLEY" LANTERN.

### **THE GENERAL ELECTRIC CO., LTD.**

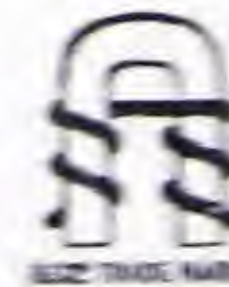
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#### INTRODUCTION.

IN these days of fast moving traffic, good street lighting is a most essential factor in the comfort, convenience and safety of the community generally. A satisfactory system of street lighting enables pavements to be traversed in comfort, and road crossings to be negotiated in safety. In other words, the ideal street lighting system should be such as to make it possible for normal daylight activities to be continued at night time with an equal degree of comfort and convenience. In the planning of a street lighting system many factors must, of necessity, be taken into consideration; the requirements of each class of street and district have to be separately considered, since it is obvious that streets and thoroughfares in the principal traffic centres will require higher levels of illumination than those situated on the outskirts of the city or town. There are more than local conditions, however, to which adequate consideration must be given in the design of the successful



Fig. 1. ST. MARTIN'S LANE, LONDON, W.C.2, MID-DAY.



Fig. 2. ST. MARTIN'S LANE, LONDON, W.C.2, MIDNIGHT (same day).

street lighting installation. Important factors such as light distribution and intensity enter into the question, these, in turn, depending upon mounting heights, spacing, candle power of lamps and the efficiency of the equipment.

An installation where the whole of these factors has been taken into consideration is illustrated in Fig. 1 and 2. These reproductions of day and night photographs respectively of St. Martin's Lane, London, W.C.2, illustrate that it is possible with a scientifically designed installation, and the use of correct lighting equipment, virtually to turn night into day. The photographs are untouched and were taken on the same day, at twelve noon and twelve midnight; in the latter case the sole illumination being provided by the "Wembley" lanterns installed.



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INTRODUCTION.—(contd.)—

In Fig. 3 is illustrated another example of street lighting by "WEMBLEY" Lanterns. This illustration shows the lanterns installed at the Trafalgar Square end of Whitehall. The standards, which previously carried other light sources, are spaced at distances apart varying from 100 to 160 feet, according to the particular location in which they are installed. The height, from the road to the lamp filament, is 25 feet. Two lanterns, each equipped with a G.E.C. prismatic glass refractor and a 1500 watt clear OSRAM gasfilled lamp, are used on each of the standards.



Fig. 3. NIGHT VIEW OF WHITEHALL FROM TRAFALGAR SQUARE, ILLUMINATED BY "WEMBLEY" LANTERNS EQUIPPED WITH OSRAM GASFILLED LAMPS.

The high power gasfilled lamp is the ideal light source for street lighting, but it must be used in a lantern of correct type which conforms to the following conditions :—

1. It must successfully resist watersplash under all conditions of driving rain, drifting snow or mist.
2. The ventilation must be of such an order that, in addition to complying with the above conditions, the lamp remains cool so that its normal life is unimpaired.
3. The light rays must be directed in such a manner that the correct distribution of light is assured, and that the variation in the intensity of the illumination between adjacent standards does not exceed a reasonable amount.

As a result of the exhaustive study of these requirements, and continued experiments undertaken at the Research Laboratories of The General Electric Co., Ltd., the "WEMBLEY" lantern has been developed and fully complies with the conditions enumerated above.



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### SPECIFICATION.

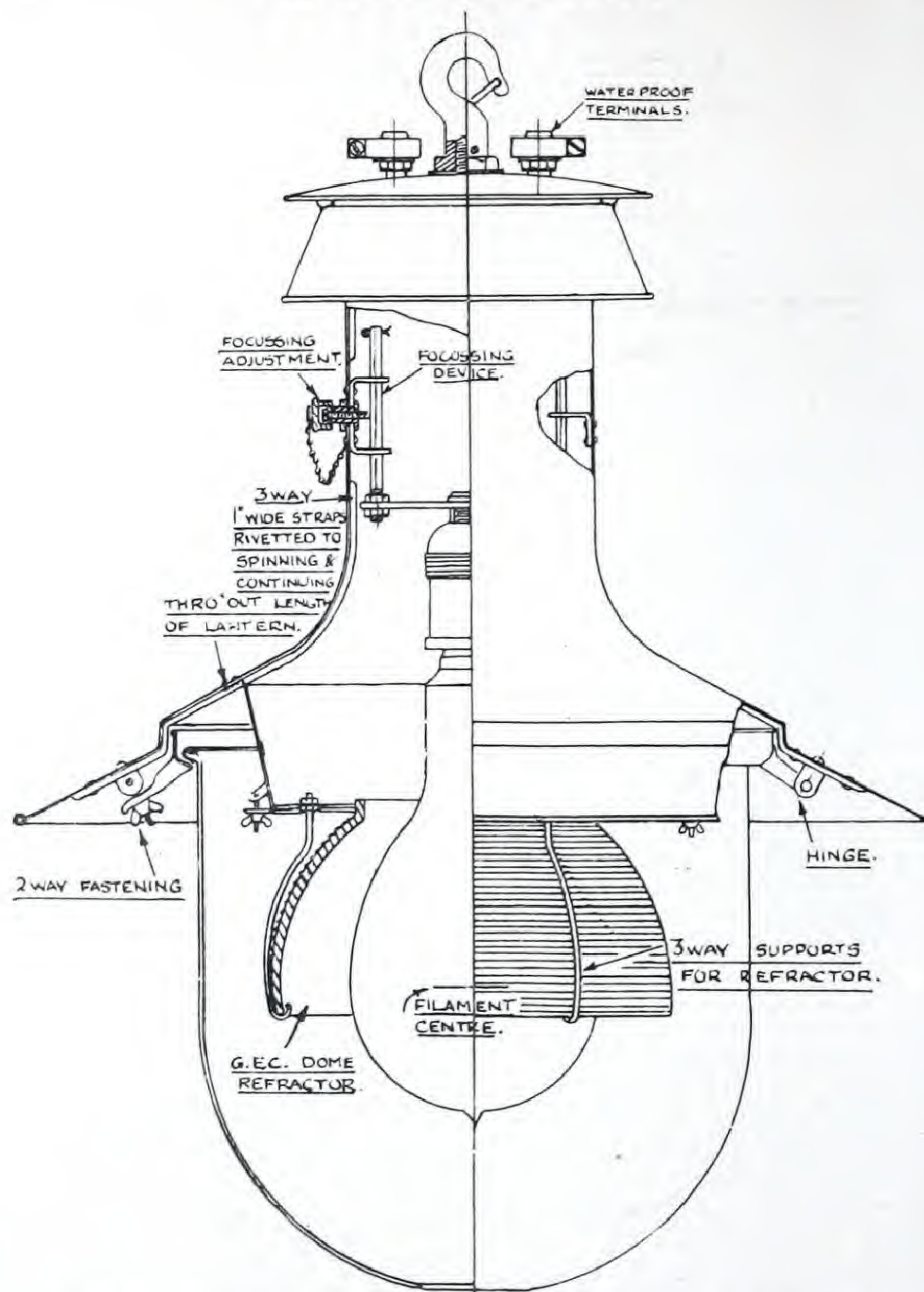


Fig. 4. SECTIONAL ELEVATION OF "WEMBLEY" LANTERN.

#### BODY.—

Spun from heavy gauge sheet copper, enamelled green outside, and white inside for reflecting surfaces, with copper top and ventilator.

#### VENTILATING DEVICE.—

A patented device operating on the ejector principle is fitted combining extreme simplicity with high efficiency. This device causes a steady stream of air to be drawn into the lantern and ejected from beneath the top cowl. Exhaustive tests have been carried out with this ventilating device, special attention being given to lamp performance. The result of these tests demonstrates convincingly that the ventilation is such as to safeguard the lamp from overheating and consequent reduction in normal life.



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#### WEATHER-PROOF CONSTRUCTION.

The development of the "WEMBLEY" lantern to its present high state of efficiency was accompanied by periodical tests to prove that it was absolutely weather-proof.

One of the tests to which the "WEMBLEY" lantern was subjected is illustrated in Fig. 5. Here a "WEMBLEY" lantern is shown in a glass tank under the bombardment of a number of jets of water which strike the lantern body, conductors, and even the live terminals with considerable force.

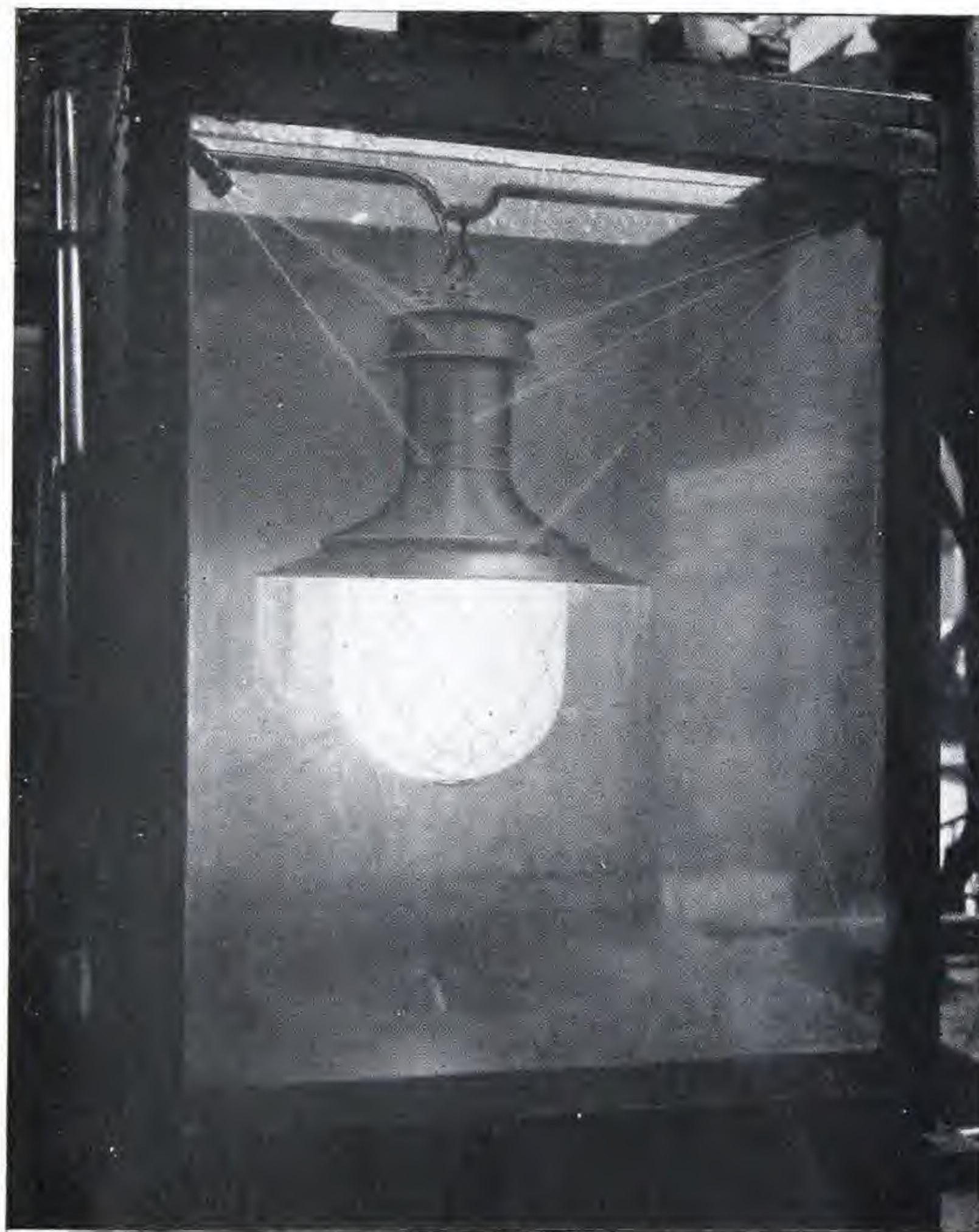


Fig. 5. ONE OF THE TESTS CARRIED OUT ON "WEMBLEY" LANTERNS.

The object of the test was to demonstrate the suitability of the "WEMBLEY" lantern to withstand the severest weather conditions and, at the same time, provide such ventilation that the normal life of a 1500 watt lamp remained unimpaired. That these conditions are fully met with is apparent from the illustration, since the continuous rain of water upon the lantern is very much greater than would be experienced under heavy rain even if the latter were propelled by a driving wind of hurricane force.

In the final test a number of "WEMBLEY" lanterns were erected in an outside position and subjected for periods of 24 hours at a time to artificial "rain" produced by forcing water through perforations in a horizontal pipe placed above them. The lanterns were suspended



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#### SPECIFICATION (contd.)—

as closely as possible to each other in order to produce the maximum of cross-splash. In addition, water at a pressure of 85 lbs. per square inch was projected upon the lanterns from various angles. These tests, which exceeded in severity even the most adverse conditions likely to be met with in actual practice, failed in every instance to break down the weather-proof properties of the lantern, neither were any lamp failures experienced other than those due to the expiration of their normal life.

It is well-known that the most severe tests are obtained in driving snow, and during heavy blizzards there was no case of failure or trouble over the whole of a new installation of these lanterns, while many failures were reported to have occurred in types, not so ventilated, installed in exactly similar positions and under the same conditions.

#### TERMINALS.

Terminals of special weather-proof construction are fitted embodying a thoroughly reliable electrical contact, high insulating qualities and ease of connection and disconnection.

#### FOCUSSING DEVICE.

An extremely ingenious focussing device is provided, operated by a screw on the exterior of the lantern. A half turn of this screw allows the lamp to be instantly adjusted to any desired position.

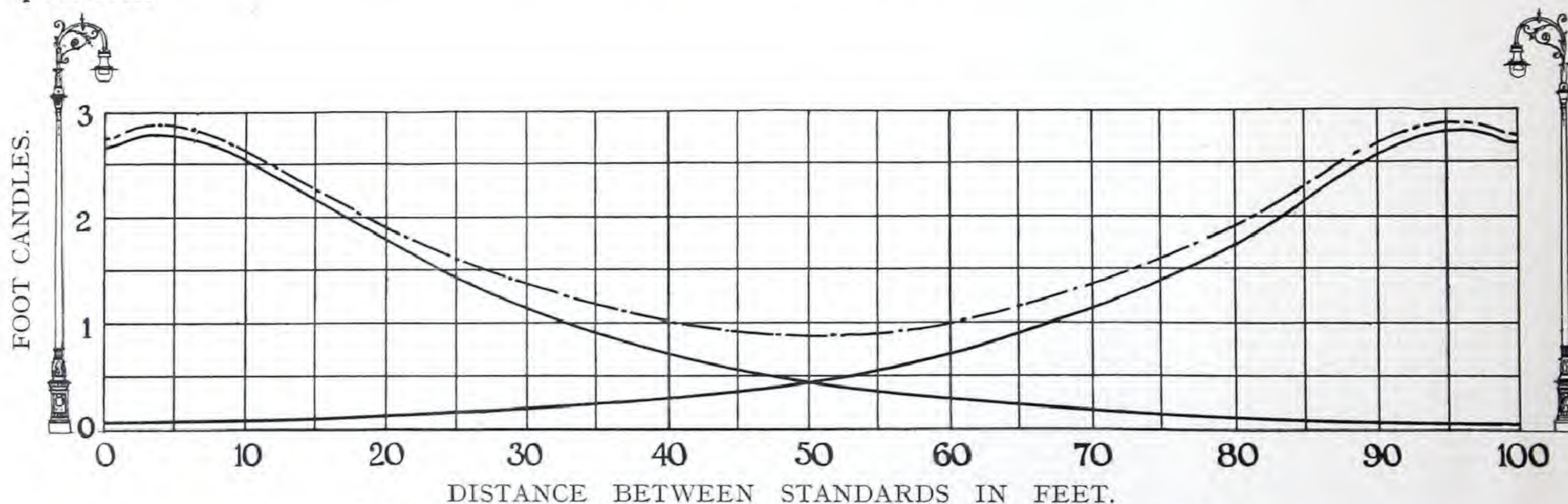


Fig. 6. CURVES OF ILLUMINATION FROM TWO “WEMBLEY” LANTERNS.

Showing horizontal illumination on a plane 3 feet above ground level, lanterns spaced 100 feet apart; suspension height 25 feet to filament; one lantern per standard, equipped with 1000 watt 100 volt. zigzag filament **OSRAM** Gasfilled Lamp. The above curves show :—illumination from single lanterns (indicated by continuous line), illumination from both lanterns (indicated by broken line).

AVERAGE ILLUMINATION 1.75 FOOT-CANDLES, MAXIMUM ILLUMINATION 2.89 FOOT-CANDLES,  
MINIMUM ILLUMINATION 0.90 FOOT-CANDLES.

$$\text{INEQUALITY RATIO} = \frac{\text{MAX. ILLUMINATION.}}{\text{MIN. ILLUMINATION.}} = 3.2$$

$$\text{SPACING RATIO} = \frac{\text{SPACING DISTANCE}}{\text{HEIGHT}} = 4.$$

#### OPTICAL SYSTEM.

The “WEMBLEY” lantern is made in two sizes, designed to accommodate OSRAM gasfilled lamps of from 300 to 500 watt and from 1000 to 1500 watts respectively. It is equipped with a prismatic glass refractor and white enamelled over-reflector, the lamp and refractor being protected by a clear glass outer globe.



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SPECIFICATION.—(Contd)

#### PERFORMANCE.

Fig. 7 shows a polar curve of a single “WEMBLEY” lantern equipped with one 1000 watt OSRAM gasfilled lamp, refractor and clear globe. The light emission is ideal for street lighting, the maximum candlepower of 2680 being given at the useful angle of  $70^\circ$  from the vertical. The resultant illumination from two such units suspended at a height of 25 feet from the ground and spaced 100 feet apart is shown by the curve in Fig. 6. The values shown are

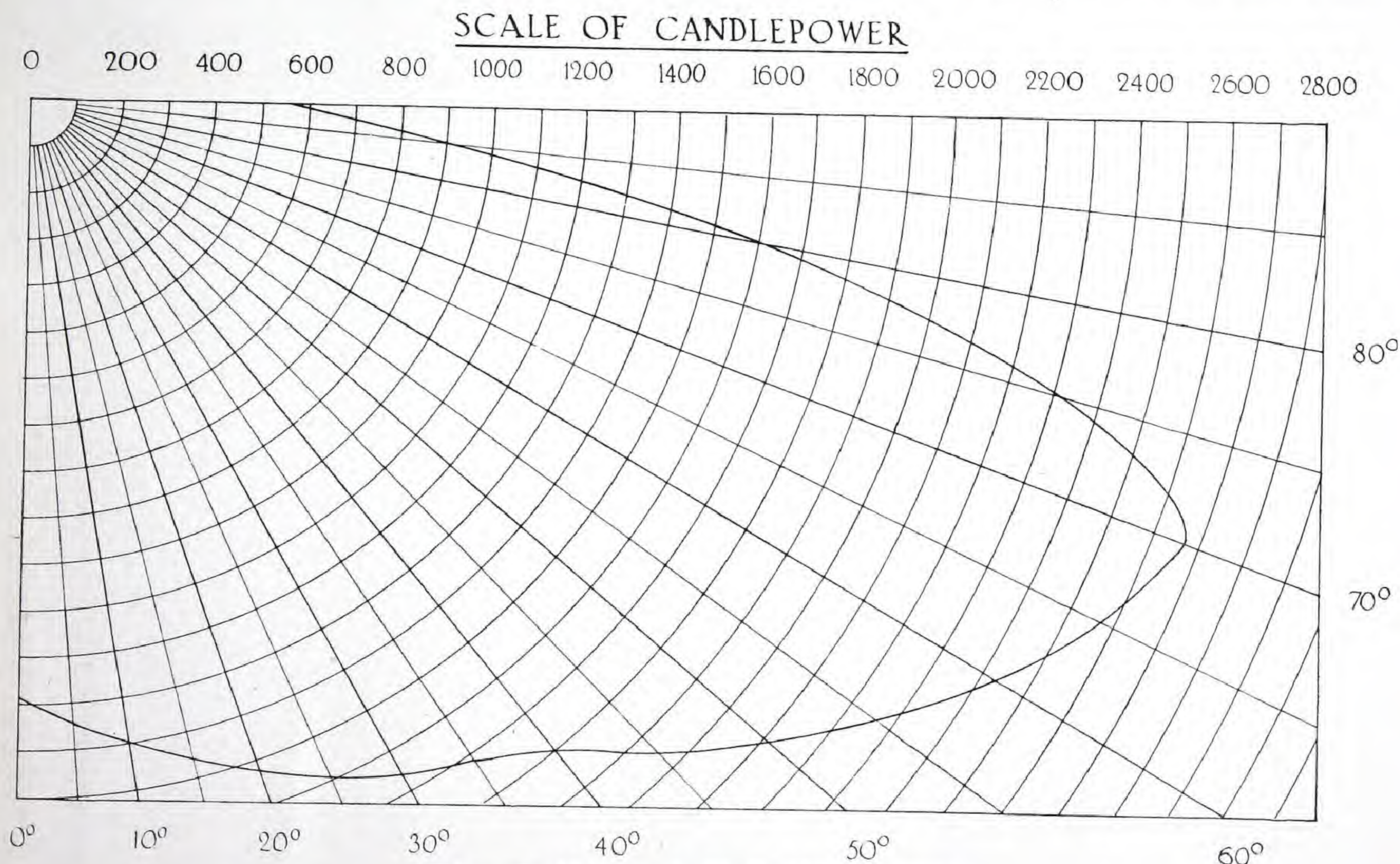


Fig. 7. POLAR CURVE OF “WEMBLEY” LANTERN.

*Equipped with one 1000 watt Osram Gasfilled Lamp, and G.E.C. prismatic glass refractor.*

obtained on a horizontal plane 3 feet above ground level and it will be seen that the maximum illumination occurs at approximately 4 feet from the base of the standards and is 2.89 foot candles. The minimum illumination is 0.90 foot candles and the average intensity 1.75 foot candles. Thus, with a spacing ratio of 4 to 1, which is in accordance with the best modern practice, an inequality ratio (i.e. maximum illumination divided by minimum illumination) of 3.2 to 1 is obtained—a highly satisfactory figure.



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FC. 6046/7. THE "WEMBLEY" LANTERN.

Cat. No.	Description.	Wattage of Lamps.	Diameter of Reflector.	Overall Length, including Globe and Hook.	Net Weight.			Price.
					Lantern.	Outer Globe	Reflector.	
FC. <b>6046</b>	"Wembley" Street Lighting Lantern	Watts. 1000—1500	ins. 24	ft. ins. 2 9	lbs. 22	lbs. oz. 5 0	lbs. 5	<b>On Application</b>
FC. <b>6047</b>	do. do.	300—500	18	2 0	12	2 6	3	

*The Illuminating Engineering Dept. of the G.E.C. has made a special study of street lighting and the services of their engineers is at the disposal of those interested, to give advice regarding any proposed scheme or for the improvement of existing installations.*